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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,293	02/23/2004	Deming Liu	P/4076-69	2086
2352	7590	06/21/2005	EXAMINER	
OSTROLENK FABER GERB & SOFFEN 1180 AVENUE OF THE AMERICAS NEW YORK, NY 100368403			THAI, LUAN C	
			ART UNIT	PAPER NUMBER
			2891	

DATE MAILED: 06/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

E/L

<b>Office Action Summary</b>	<b>Application No.</b> 10/785,293	<b>Applicant(s)</b> LIU ET AL.	
	<b>Examiner</b> Luan Thai	<b>Art Unit</b> 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 14-17 is/are rejected.
- 7) ☒ Claim(s) 9-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4-8, and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (e.g., figures 3-4) (hereinafter "Art-3/4") in view of Collins et al. (6,608,291).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 1-2, 4-8, and 14-17, "Art-3/4" discloses (see Applicant's Specification page 1, lines 11-34; pages 2; page 3, lines 1-5; page 5, lines 23-33; page 6; and page 7, lines 1-17) an apparatus and method for die attachment onto a substrate (12/16) including non-metallic material (14/20), and metallic material (13/18) that is adapted to receive a die (10) having a eutectic coating (11), comprising: a heating conduit (22) through which the substrate (12/16) is movable on a non-metallic support or hot plate (27) for heating the metallic material to a eutectic bonding temperature to facilitate bonding between the die and the metallic material at a die-attach position, and an heating element (30/32) at the die-attach position for heating the metallic material to the eutectic bonding temperature. The "Art-3/4", however, fails to teach the heating element that provides heat at the die-attach position is an induction-heating device.

Collins et al. while related to an induction heating apparatus teach that the an induction heating device, which comprises a metal coil and is operated at 0.5 MHz or more (Col. 1, lines 51+, Col. 2, lines 16+) with the power output less than 10 kilowatts (Col. 2, lines 22+, Col. 4, lines 32+), may be advantageously practiced in semiconductor applications to effectuate precise bonding between integrated circuits and substrates (Col. 8, lines 14+, Col. 1, lines 51+) because the induction heating system makes it possible to attach and re-flow the bonding material effectively without adversely affecting the surrounding material (Col. 8, lines 25+). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Collins et al.'s teachings with Wrobel's process and apparatus would have been beneficial because Collins et al.'s teachings help to attach the die to the metallic material of the substrate and re-flow the bonding material effectively without adversely affecting the non-metallic material of the substrate.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (e.g., figures 3-4) (hereinafter "Art-3/4") and Collins et al. (6,608,291) as applied to claim 1 and further in view of Baudry et al. (4,973,826).

Regarding claim 3, the proposed apparatus and method of the "Art-3/4" and Collins et al. discloses the claimed invention as described above except for teaching the non-metallic support surface (or the hot plate 27) being made of ceramic material.

Glass-ceramic material, however, is commonly chosen for hot plate, as taught by Baudry et al., for the fact that it has a zero coefficient of expansion which renders it very resistant to thermal shocks (Col. 3, lines 32-36). It would have been obvious to a person of ordinary skill in

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the art at the time the invention was made to use ceramic material for the hot plate in the proposed apparatus and method of the "Art-3/4" and Collins et al. because ceramic material is commonly chosen for the hot plate for the fact that it has a zero coefficient of expansion which renders it very resistant to thermal shocks, as taught by Baudry et al.

***Allowable Subject Matter***

4. Claims 9-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter:

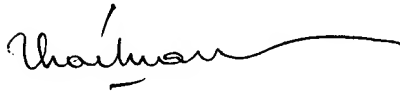
The prior art taken either singly or in combination fails to anticipate or fairly suggest the method steps of *maintaining the temperature of the metallic material below a glass transition temperature of the non-metallic material prior to induction heating at the die-attach position*, as recited in claim 15, and this steps could not easily be conceived of even by a person skilled in the art in the light of the features disclosed in the cited prior arts.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is 571-272-1935. The examiner can normally be reached on 6:30 AM - 5:00 PM, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley W. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Luan Thai', with a long, sweeping horizontal line extending to the right.

**Luan Thai**

Primary Examiner

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June 18, 2005